

REMARKS

By the present amendment, Applicant has amended Claims 1, 5, 12, 23 and 24, and cancelled Claims 17-22. Claims 1-16, 23 and 24 remain pending in the present application. Claims 1 and 5 are Independent Claims.

Please note that a **Revocation of Power of Attorney with New Power of Attorney and Change of Correspondence Address** is being filed concurrently with this amendment and response. Please direct all correspondence to the address associated with Customer Number 37833.

In the Response to the Restriction Requirement, dated October 31, 2006, filed by Applicant's previous attorneys, Group I was elected. Non-elected Claims 17-22 (Group II) have now been canceled from this case by the present amendment.

In the present Office Action, the Examiner rejected Claims 1-16, 23 and 24 under 35 U.S.C. §103(a) as being unpatentable over the Sakata et al. reference. The Examiner further rejected Claims 1-16, 23 and 24 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as obvious over the article by Zabidi et al.

Applicant will advance arguments hereinbelow to illustrate the manner in which the presently claimed invention is patentably distinguishable from the cited and applied prior art. Reconsideration of the present application is respectfully requested.

The Sakata reference is directed towards the effect of lead oxide addition to the photocatalytic behavior of TiO_2 . The catalyst used in the process was dispersed in well-outgassed aqueous methanol and irradiated by a 500W Xe lamp. Xenon lamps are well known and commonly used in the field of optics, since xenon, when excited, produces a broad spectrum of light, from infrared, through the visible spectrum, and into ultraviolet. Xenon is often used in applications in which a full-spectrum "white" light is required. The infrared portion of the xenon spectrum extends to between approximately 850 and 900 nm.

In the Sakata reference, the xenon lamp is used to produce a broad spectrum of light, with only wavelengths below 420 nm. being cut off. Thus, the sample is irradiated with light ranging from 420 nm. to approximately 900 nm.; i.e., light from the center of the visible spectrum through far infrared is being used to irradiate the sample. As is well known, due to the quantum nature of chemical reactions, both the electrons associated with atoms and the atoms themselves are excited only at discrete wavelengths. Thus, in order for a controlled reaction to occur, it is desirable to use only a single or a discrete set of wavelengths. The wavelengths of light which are not directly absorbed through excitation of the electrons or atoms create interference, mostly through introduction of thermal energy into the system. In a solution, such as that described above, turbulence in the fluid can create unwanted effects, with a lower yield of hydrogen being the direct result.

In contradistinction, the method of the present Patent Applications includes irradiation by a laser. Lasers produce coherent light, with all photons not only being in phase with respect to one another, but being produced at a single, definite wavelength. In

order to reduce unwanted interference within the reaction, and produce the highest yield of hydrogen, the use of only a single wavelength is desired.

Unwanted thermal effects and optical interference are not the only factors which affect hydrogen production. The intensity of the light used has a direct effect upon the hydrogen production, since energy transfer is directly dependent upon the irradiation intensity. In the Zabidi reference, the light is produced by a XeCl laser, and a set of interference filters are utilized to produce light at 313, 365, 405 and 436 nm. However, the intensity of each laser pulse is only between 11 and 32 mJ/pulse.

The minimal energy intensity described in the Zabidi reference is well outside of the 50-300 mJ range described and claimed in the present Patent Application. The Applicant found optimal hydrogen production occurring at 150 mJ/pulse (as claimed in Claims 13-16, as originally filed). Although the determination of "obviousness" under 35 U.S.C. §103(a) allows for ranges which "do not overlap but are close enough that one skilled in the art would have expected them to have the same properties" (see MPEP 2144.05(I)), the Zabidi reference discloses a pulse intensity which is, at most, 21% of the optimal pulse intensity of the subject invention; i.e., one of ordinary skill in the art would not find the Zabidi range to be "close" to that described, and claimed, in the subject Patent Application.

Thus, neither the Sakata reference nor the Zabidi reference, when taken alone or combination, provide for: "... said single wavelength of laser radiation being delivered as

a pulse having an energy per pulse of between approximately 50 mJ and 300 mJ ...”, as is clearly provided by newly-amended Claims 1 and 5.

Therefore, the subject Patent Application is not seen to be made obvious by, or anticipated by, the Sakata reference or the Zabidi reference, when taken alone or combination, when Independent Claims 1 and 5 are carefully reviewed.

It is now believed that remaining Claims 2-4, 6-16, and 23-24 show patentable distinction over the prior art cited by the Examiner for at least the same reasons as those previously discussed for Independent Claims 1 and 5.

The remaining references cited by the Examiner and further provided by the Applicant but not used in the rejection have been reviewed, but are believed to be further removed when patentable distinctions are taken into account than those cited by the Examiner in the rejection.

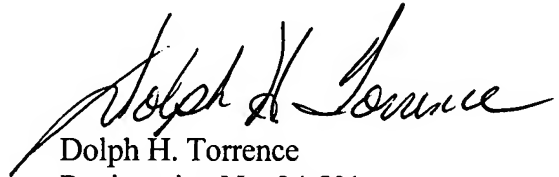
The claims in this application have been revised to more particularly define Applicant's unique construction in view of the prior art of record. Reconsideration of the claims in light of the amendments and for the following reasons is respectfully requested.

Application No. 10/821,970
Art Unit 1754

Attorney Docket No. 18692.43
Confirmation No. 3096

For the foregoing reasons, Applicant respectfully submits that the present application is in condition for allowance. If such is not the case, the Examiner is requested to kindly contact the undersigned in an effort to satisfactorily conclude the prosecution of this application.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Dolph H. Torrence".

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DHT:mdr

Attachments: Petition for Extension of Time
Check for \$60.00
Copy of New Power of Attorney